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AUTHOR Chang, Tsan-Kuo; And Others
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ABSTRACT

Since the telephone interview is often used as a method in survey research, a study was conducted to determine whether use of random digit dialing and sampling by surnames resulted in selection of two different samples from the same ethnic population. A random digit dialing technique was used to conduct interviews with 1,076 Texas residents over the age of 18 between February and May 1984. The sample included 168 Hispanics. To supplement it, a special sample of persons with Hispanic surnames was selected, using telephone directories from 29 cities with large Hispanic populations. An additional 142 respondents were added to the total sample. Respondents were considered Mexican Americans based on whether they said their ethnic origin was wholly or partially Hispanic, which included Mexican-Americans, Puerto Ricans, and Cubans. Four sets of variables were examined: respondents' background, ethnically related items, ethnic cultural evaluation issues, and general and ethnic media use. Results showed that the two methods did not produce different samples from the same Mexican American population. (A copy of the survey questions is appended.) (HOD)

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Mexican-Americans as an Ethnic Sample: Random Digit Dialing vs. Sampling by Surnames

Tsan-Kuo Chang
Wayne A. Danielson
Stephen D. Reese
Pamela J. Shoemaker

University of Texas at Austin
Department of Journalism
Austin, Texas 78712
512-471-7708

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Tsan-Kuo Chang is a doctoral candidate and Wayne A. Danielson, Stephen D. Reese, and Pamela J. Shoemaker are faculty members at the University of Texas at Austin Department of Journalism. This study was part of a larger project conducted under a grant from the Gannett Foundation to the last three authors.

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Mexican-Americans as an Ethnic Sample: Random Digit Dialing vs. Sampling by Surnames

Abstract

This study examines whether use of random digit dialing and sampling by surnames resulted in selection of two different samples from the same ethnic population. Random digit dialing technique was used to conduct interviews with 1,076 Texas residents over the age of 18 between February and May of 1984. This sample included 168 Hispanics (15.6%). To supplement it, a special sample of persons with Hispanic surnames was selected, using telephone directories from 29 cities with large Hispanic populations. An additional 142 respondents were added to the total sample. Respondents were considered Mexican-Americans based on whether they said their ethnic origin was wholly or partially Hispanic, which included Mexican-Americans, Puerto Ricans, and Cubans. Four sets of variables were examined: respondents' background, ethnicity-related items, ethnic cultural evaluation issues, and general and ethnic media use. Results show that the two sampling methods did not produce different samples from the same Mexican-American population in Texas. Implications of the findings are discussed and direction of further study is suggested.

Mexican-Americans as an Ethnic Sample: Random Digit Dialing vs. Sampling by Surnames

As lower cost long distance telephone service has become ubiquitous, social scientists have frequently used the telephone interview as a legitimate method in survey research. To deal with the problems caused by unlisted numbers, multiple listings and new subscribers, random digit dialing (RDD) has been developed (e.g., Cooper, 1964; Glasser and Metzger, 1972; Waksberg, 1978; Frey, 1983: 68-77). It has improved the degree of representativeness of the sample in telephone survey and been used to locate a special sample such as black households or households with higher income (Hauck and Cox, 1974; Blair and Czaja, 1982).

Selection of a sample from the general population by random digit dialing is usually efficient and appropriate, especially in central cities and some of the suburbs of large SMSAs where a higher percentage of all telephones may be unlisted (Sudman, 1976:65). It is also accurate compared to other survey methods such as a complex sampling design in which housing units and personal interview were used (Klecka and Tuchfarber, 1978).

In many instances, however, researchers may be interested in comparing a certain ethnic group in the total population with the majority group on a number of variables. The research objective may, for example, call for a comparison between Mexican-Americans and Anglos on attitudes toward bilingual education in the United States and their general media use pattern (e.g., Greenberg et al., 1983; Shoemaker, Danielson and Reese, 1984). Or, it may deal with the impact of ethnicity on buying behavior (e.g., Hoyer and Deshpande, 1982). In cases like this, the researchers may want to oversample a particular ethnic group for comparative and explanatory purpose. Random digit dialing may not yield a satisfactory number of cases for an ethnic group of interest since members of ethnic minorities are usually hard to locate in the total population without prior consideration of their geographical clustering or without some screening procedures. Sampling by ethnic surnames seems to be an alternative in dealing with such a problem. This technique, as demonstrated in a recent study (Himmelfarb, Loar and Mutt, 1983), "is likely to produce a fairly representative sample of American

Jews."

This paper examines if these two methods resulted in significantly different samples of the same ethnic population. While each of the two sampling methods has been used in previous studies in selecting ethnic samples, it is as yet unclear whether these two procedures will yield significantly different groups within a single ethnic population. The results could have important methodological implications for studies using ethnic samples. For one thing, as the Hispanic population in the United States continues to grow and becomes more politically active today than ever before (Brischetto and de la Garza, 1983), it will become more important in survey research to examine this subgroup in the population for comparison purpose.

Sampling by Random Digit Dialing

In most studies, random digit dialing generally ignores telephone directories and starts with a "seed" number. This seed number is usually defined as the first eight digits of a telephone number (area code + exchange number + the next two digits), such as 512-478-18xx, which is retained from a working residential number in the pretest. The complete telephone number can be created by adding two random digits to the seed number.[1] Thus, each seed number can generate a possible 100 telephone numbers. These numbers are then called to reach the potential respondents.

Several studies have shown that random digit dialing can be successful in locating a special sample. Hauck and Cox (1974) provided evidence that screening by telephone with random digit dialing could be used to obtain household composition information necessary to locate the special samples. They suggested that it may be feasible and economical to use this technique prior to general population surveys. Blair and Czaja (1982) used random digit dialing to locate two special population samples: the "affluent" sample (a sample of households with family income of $30,000 or more) and a black household sample (a sample of households in which the head of household is black). They indicated that their design is "likely to be especially effective when the special population is highly clustered, as is the case with some racial groups."

It is quite common that the majority of ethnic minorities in the United States tend to live in

geographically clustered areas. This phenomenon benefits social scientists when ethnic minorities become the target group in survey research. As is usually the case, the possibility is high that residents in the same area will share the same telephone exchange numbers and are more likely to have phone numbers in sequence. In other words, residents in the same area can be expected to have telephone numbers within a certain range of sequential numbers. Since ethnic minorities are highly clustered, use of random digit dialing will at least reach a certain proportion of ethnics even without screening. Theoretically, all things being equal, random digit dialing may result in the selection of ethnic minority members proportionate to the total population. In reality, ethnic minority samples are rather difficult to locate without some sampling frames.

Sampling by Surnames

Sampling by surnames is another technique that has been attempted in survey research. According to Himmelfarb et al. (1983), sampling by surnames has been used for some time. Over the years this technique has been employed to identify clusters of Jewish and other populations. For example, one study (Massarik, 1966) has suggested that use of distinctive Jewish surnames can produce a fairly good estimate of the total size of the American Jewish population. By comparing with other sampling methods such as list sample and area sample, Himmelfarb et al. (1983) also found that use of surnames is likely to generate a sample that is fairly representative of Jews in the United States. Aside from studies of American Jews, however, sampling by surnames has seldom been used in survey research of other ethnic minorities.

Obviously, sampling by surnames requires use of existing name lists with phone numbers and addresses, such as telephone or house directories and organizational lists. In survey research, use of the telephone directory is a common practice as it contains the most comprehensive names and phone numbers in a given area. Like any other lists, however, telephone directories have their limitations that will introduce a certain degree of bias (e.g., Perry, 1968-69; Leuthold and Scheele, 1971; Frey, 1983: 58-62). First, in addition to new subscribers, there may be unlisted names or multiple listings for the same person. Second, some members of an ethnic group do not necessarily have their ethnic surnames listed in the telephone directory. This is more apparent in cases of intermarriage, especially

for women. Thus, it has been suggested that married women with ethnic origin may be underrepresented in the telephone directory (Himmelfarb et al., 1983).

The purpose of this paper is to compare whether the two sampling methods, RDD and ethnic surname selection, will yield different samples from a single population. As the fastest growing and the second largest ethnic minority in the United States, Hispanics have attracted increasing interest in communications research. Their social economic status, interactions with the environment or community, attitudes toward indigenous culture and customs, and use of general and ethnic media have been key variables in ethnic research. This study uses these important variables to test for differences between the two sampling techniques. If none is found, the sampling-by-surnames method may be a more efficient technique for many researchers.

Methods

Sample

This study is part of a larger project on the Hispanics and mass media in Texas,[2] in which the two sampling methods mentioned above were employed to produce a subsample of Mexican-Americans for comparison purpose. Data for this study were based on this subsample of Mexican-American respondents. In the first method, random digit dialing technique was used to conduct interviews with 1,076 Texas residents over the age of 18 between February and May of 1984. Two-hundred telephone exchanges were drawn at random without replacement from a list of Texas exchanges. A working "seed" bank within each exchange was established during pre-testing, and 20 random two-digit numbers were added to each seed number (e.g., 512- 478-18--) to create the numbers in each of 200 "clusters." Four interviews were attempted in each cluster for a target sample size of 800. One of the goals of the larger study was to describe Mexican- Americans in the state. Thus, those exchange numbers producing two or more Hispanic respondents were oversampled to reach the final N of 1,076. This final sample included 168 Hispanics (15.6%).

This proportion of Hispanic respondents was considered inadequate for comparative analysis. In order to supplement it, a special sample of persons with Hispanic surnames was selected. This random sample was drawn using telephone directories from 29 cities with large Hispanic population.[3]

Telephone numbers were randomly chosen from each city's phone listings, proportionate to its size, such that cities with larger populations contributed more respondents to the sample. The selection of phone numbers was conducted by first selecting a random page, column and location, and then the nearest number associated with a Hispanic surname was searched and included in the sample. This procedure was repeated to obtain an overall target size of 400 phone numbers. Using this method, an additional 142 respondents were added to the total sample. Two of these respondents declined to give their ethnicity and were counted as missing data. The present analysis is based on the final Hispanic sample size of 308.

When these respondents from both sampling methods were called, interviewers asked for a male or female resident at random and made as many as five call-backs on different days to reach a respondent. Only after five such unsuccessful attempts or if the number was non-working or a business, was it replaced with another from the cluster. For the regular sample the completion rate was 55.1 percent and the refusal rate 21.1 percent. In the special sample the completion rate and refusal rate were 69.6 percent and 8.8 percent, respectively.

Measures

Respondents were considered Mexican-Americans based on whether they said their ethnic origin was wholly or partially Hispanic, which included Mexican-Americans, Puerto Ricans, and Cubans. Since Mexican-Americans accounted for most of the Hispanic respondents (86.4%), the label Mexican-American is used throughout this study because it is the most common name applied to Hispanics in Texas. Four sets of variables were examined: respondents' background, ethnicity-related items, ethnic cultural evaluation issues, and general and ethnic media use.

The background variables were as follows: length of residence in Texas, country of birth, level of education, total family income, occupation, sex, and age. Ethnicity-related variables included how many neighbors and friends are Mexican-Americans, whether they have relatives living in Latin America, how often they correspond with relatives in Latin America, and whether they have visited any Latin American country in the last 10 years.

Evaluations of Mexican-American culture were sought using three questions: to what extent did respondents prefer Mexican-American culture and customs to other culture and customs; given the choice, to what extent would they rather associate with Mexican-Americans than with other people; and, to what extent did they feel Mexican-Americans are different from other people?

Questions of general media use asked respondents how many hours they spent watching television and listening to radio in a day and how many minutes they spent reading newspapers and magazines in a day. Ethnic media exposure questions asked respondents how much of TV news, TV, and radio they watched or listened to was in Spanish, and how many of the newspapers and magazines they read were in Spanish. Exact questionnaire items are contained in the appendix.

Results

Table 1 compares the random-digit-dialing group with the sampling-by- surnames group on seven background variables. Except for sex, none of the other variables showed any significant difference between the two groups. Random digit dialing method picked up more female respondents than that of sampling by surnames. This suggests that female respondents with ethnic surnames were probably underrepresented in the telephone directory. It should be noted, however, that because of the predominance of female respondents being interviewed in the regular sample, an attempt was made to interview as many male respondents as possible in the special supplemental sample. Whether the difference is due to use of different sampling procedures or is a result of oversampling male respondents in the special sample remains to be further examined. As for the other variables, the two methods seem to select quite similar Mexican-American respondents.

Comparison of the samples on ethnicity-related variables are shown in Table 2. Three of the five variables showed significant difference between the two sampling methods. Respondents selected by their surnames reported having more Mexican-American neighbors and friends than those selected by random digit dialing. These respondents were also more likely to have visited Latin America in the last 10 years than respondents in the random-digit-dialing sample. These results seem to suggest that respondents chosen by their surnames had higher percentages of ethnic contacts than those selected by random digit dialing. That may be an indication that respondents in the sampling-by-surnames

sample tend to live more closely to other Mexican- Americans than those in the other sample. This may be the case because respondents with Hispanic surnames were selected from 29 cities where there is a large Hispanic population. Many of these cities are near the U.S.-Mexican border, therefore this finding may well be an artifact of the study design.

The two sampling methods did not produce groups of Mexican-Americans who were different on the cultural evaluation variables. Table 3 shows that respondents selected by the two techniques were very similar in their attitudes toward Mexican-American culture items.

A similar pattern was found for the general and ethnic media use variables (Table 4). Respondents from the two samples did not show any significant difference in their general media use and ethnic radio and TV news exposure. However, respondents selected by their surnames reported higher exposure to ethnic TV and newspapers and magazines than respondents in the other sample. Since respondents chosen by their surnames were from the highly populated Hispanic cities where Spanish media are generally available, presumably they would have more access to these media than those selected randomly in the state.

Discussion

Of the 23 variables tested, six (26%) showed statistically significant differences between the two sampling methods beyond the .05 level. Five of the six variables that indicated significant differences between RDD and ethnic surname selection method are clearly related to ethnic characteristics. On these variables, respondents selected by their surnames were more likely to have strong ethnic orientation than those chosen by the random digit dialing technique. These cases need to be further examined to determine whether the differences are indeed due to the use of different sampling methods. As previously discussed, these differences are probably explainable by the study design.

This study does not intend to show that one particular sampling method is better than another. Rather, the major concern is whether and to what extent different sampling methods would result in different samples from the same population. Since samples selected by the two methods seem similar on various variables, the implication is that use of telephone directories in the selection of ethnic minority samples is just as good as random digit dialing, especially when telephone books are

comprehensive and updated. To the extent that use of telephone directories is easier and cheaper, it should be used. However, if the researchers are interested in the study of ethnic interpersonal communication behavior, the sampling method, RDD or sampling by surnames, is important as the two techniques may produce respondents who are different on the variables under study. This study has shown that sampling-by-surnames method produced respondents from more ethnically concentrated neighborhoods.

While this study has shown that sampling by ethnic surnames may be useful and effective as a supplement to random digit dialing, future studies are needed because there are questions that are left unanswered. Would these findings hold in other geographic areas? Would it matter if there was a less stable (i.e., more transient, short-term) minority population or if there were fewer minorities? Also, are there differences in types of surnames? Can the ethnic origin of a surname be ambiguous so that someone who is of one ethnic group is taken for a member of another group? The last question deserves special attention in the area of ethnicity study. According to a forthcoming study by Rohit Deshpande,[4] respondents who are assumed to be members of one ethnic group are often actually members of another group. Some people will not be easily identified by their surnames. Specific questionnaire items based on measures of ethnicity will have to be designed to identify these respondents.

Table 1: Differences in Background Between Random Digit Dialing and Sampling by Surnames

Background variables	Random digit dialing	Sampling by surnames	X^2
How long lived in Texas?			
Less than a year	0.6%	2.1%	2.42
1 - 4 years	4.8	3.6	
5 - 9 years	6.6	4.3	
10 years or more	88.0	90.0	
N =	167	140	
Born in what country?			
In U.S.	72.3	66.4	0.97
Outside U.S.	27.7	33.6	
N =	166	140	
Highest level of education			
Some grade school	20.0	18.0	5.22
Completed grade school	10.3	7.9	
Some high school	18.2	11.5	
Completed high school	21.2	25.9	
Some college	21.2	24.5	
Completed college	4.8	6.5	
Some graduate school	1.2	0.7	
Completed graduate school	3.0	5.0	
N =	165	139	
Total family income			
Under $10,000	35.8	32.8	3.17
$10,000 - $29,999	47.3	56.6	
$30,000 - $49,999	12.2	7.4	
$50,000 or more	4.7	3.3	
N =	148	122	
Occupation			
Professional	8.8	14.1	8.20
Managerial	8.8	10.4	
Clerical	5.7	11.1	
Skilled or trade	10.1	6.7	
Services or labor	18.2	18.5	
Agricultural	3.1	1.5	
Military	1.3	2.2	
Other (housewives, etc.)	44.0	35.6	
N =	159	135	
Sex			
Male	35.7	52.1	7.74*
Female	64.3	47.9	
N =	168	140	
Age	38.3**	40.1	

* $p < .01$ ** Mean age, N.S.

Table 2: Differences in Ethnicity-related Variables Between Random Digit Dialing and Sampling by Surnames

Ethnicity-related variables	Random digit dialing	Sampling by surnames	X^2
How many neighbors are Mexican-Americans?			
None	7.9%	2.2%	25.74**
Very few	25.0	11.6	
About a third	11.0	7.2	
About half	11.0	13.0	
About two-thirds	9.8	5.1	
Almost all	35.4	60.9	
N =	164	138	
How many friends are Mexican-Americans?			
None	4.8	1.4	11.98*
Very few	15.2	6.5	
About a third	3.0	5.8	
About half	18.8	22.3	
About two-thirds	7.3	12.9	
Almost all	50.9	51.1	
N =	165	139	
Relatives living in Latin America?			
No	56.6	46.0	2.98
Yes	43.4	54.0	
N =	166	139	
How often correspond with Latin America?			
Never	23.6	30.1	2.48
Once a year	20.8	26.0	
Two or more times a year	23.6	15.1	
More often	31.9	28.8	
N =	72	73	
Visit Latin America in last 10 years?			
No	44.9	21.6	17.29**
Yes	55.1	78.4	
N =	167	139	

* $p < .05$ ** $p < .001$

Table 3: Differences in Cultural Evaluation Variables Between Random Digit Dialing and Sampling by Surnames

Cultural evaluation variables	Random digit dialing	Sampling by surnames	F	d.f.	p =
Prefer to associate with Mexican-Americans than with others.	3.11	2.99	1.08	301	N.S.
Prefer Mexican-Americans culture and customs to others.	3.56	3.44	1.16	305	N.S.
Mexican-Americans are different from others.	2.98	2.83	1.44	306	N.S.

Scale for items: (1) disagree strongly, (2) disagree, (3) no opinion, (4) agree, (5) agree strongly

Table 4: Differences in General and Ethnic Media Use Between Random Digit Dialing and Sampling by Surnames

Media use	Random digit dialing	Sampling by surnames	F	d.f.	p =
Hours spent watching TV in a day	3.0.	2.85	.46	306	N.S.
Minutes spent reading magazines in a day	1.59	1.78	1.48	205	N.S.
Hours spent listening to radio in a day	2.64	2.73	.09	306	N.S.
Minutes spent reading newspapers in a day	1.57	1.67	.70	243	N.S.
How much TV news watched is in Spanish?	.71	.92	2.24	306	N.S.
How much TV watched is in Spanish?	.89	1.14	3.75	305	.05
How many newspapers and magazines read are in Spanish?	.37	.63	4.64	305	.03
How much radio listened is in Spanish?	1.46	1.60	.54	306	N.S.

Scale for minutes spent reading magazines and newspapers in a day:

(0) none, (1) 1-29 minutes, (2) 30-59 minutes, (3) 60-89 minutes, (4) 90-119 minutes, (5) 120 or more minutes.

Scale for ethnic media use:

(0) none, (1) less than half, (2) about half, (3) more than half, (4) all

Footnotes

1. There are variations in the number of random digits added to the seed number. The number of random digits usually varies from one to four digits. According to Frey (1983: 67), "the smaller the number of digit change (for example, 2 instead of 3 or 4), the more sensitive the sampling to the assignment of new numbers or unlisted numbers."

2. This project was funded by a Gannett Foundation grant to the last three authors.

3. These cities included Laredo, Encinal, San Antonio, Corpus Christi, Alamo, Brownsville, Donna, Edcouch, Edinburg, Elsa, Hargill, Harlingen, Hidalgo, La Feria, Los Fresnos, Lyford, McAllen, Mercedes, Mission, Pharr, Port Isabel, Raymondville, Rio Hondo, San Benito, San Juan, Santa Rosa, Sullivan City, Weslaco, and El Paso.

4. Personal communication, University of Texas at Austin, February 6, 1985.

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Appendix: Questionnaire Items

1. About how much of the news you watch on television is in Spanish? Would you say-- none of it, less than half, about half, more than half, all of it?

2. Overall, about how much of the television you watch is in Spanish? Would you say-- none of it, less than half, about half, more than half, all of it?

3. How much of the time that you listen to the radio is it in Spanish? None of the time, less than half, about half, more than half, all or most of the time?

4. About how many of the newspapers and magazines you read are in Spanish? Would you say-- none, less than half, about half, more than half, all of them?

5. About how many of your neighbors would you say are Mexican-Americans? Almost all, about 2/3, about 1/2, about 1/3, very few, none?

6. How many of your friends are Mexican-Americans? Almost all, about 2/3, about 1/2, about 1/3, very few, none?

7. Would you agree or disagree with the following statement? I prefer Mexican-American culture and customs to other culture and customs. Agree strongly, agree, no opinion, disagree, disagree strongly (the following items shared the same scale).

8. Given the choice, I would rather associate with Mexican-Americans than with other people.

9. Mexican-Americans are a lot different from other people.

10. In general, how many hours do you spend watching television each day, including morning, afternoon, and evening? None, 1 hour, 2 hours, 3 hours, 4 hours, 5 hours, 6 hours, 7 hours, 8 or more hours?

11. How many minutes do you spend a day reading magazines? None, 1-29 minutes, 30-59 minutes, 60-89 minutes, 90-119 minutes, 120 or more?

12. How many hours do you spend a day listening to the radio? None, 1 hour, 2 hours, 3 hours, 4 hours, 5 hours, 6 hours, 7 hours, 8 or more hours?

13. How many minutes do you spend in a day reading daily newspapers? None, 1-29 minutes, 30-59 minutes, 60-89 minutes, 90-119 minutes, 120 or more?

14. Do you have any relatives living in any Latin American countries? No, yes?

15. How often do you correspond with your relatives living in Latin America? Never, once a year, two or more times a year, more often?

16. Have you visited any Latin American country in the last 10 years? No, yes?

17. About how many years have you lived in Texas? Less than a year, 1-4 years, 5-9 years, 10-14 years, 15 years or more?